

REMARKS

Claims 1-15 are pending in the present application. The Office has rejected claims 1-15 under 35 USC Section 112 as allegedly failing to comply with the written description requirement. The Office has rejected claims 1-15 under § 103(a) as allegedly being unpatentable over Masuda optionally in view of USP No. 5,861,123 to Schiffner (“Schiffner”) and USP No. 4,181,675 to Makin et al. (“Makin”). The Office has rejected claims 1-15 under §103(a) as allegedly being unpatentable over Sobacchi in view of Makin.

By this response, the Applicants traverse all rejections and request further examination of the application.

REJECTIONS UNDER SECTION 112

The Office has rejected claims 1-15 as allegedly being indefinite. Without disclaimer or prejudice, the term “influent” has been removed from the recitations of claim 1. The Applicants request reconsideration and withdrawal of the rejections to claims 1-5 under § 112.

REJECTIONS UNDER SECTION 103

The Office rejected claims 1-15 under § 103 as allegedly being unpatentable over Masuda in view of Schiffner or Makin.

Independent claim 1 – Masuda in view of Makin or Schiffner

Because Masuda fails to disclose the recitations and because there was not reasonable expectation of success in the use of water as disclosed by Masuda, it would not have been obvious to one of ordinary skill in the art to use water as recited in claim 1, namely,

*providing a spray of water droplets or water film;
partially the oxidizing insoluble organic compounds by passing an exhaust gas stream through a pulsed corona discharge chamber in the presence of the spray of water droplets or water film to form one or more partial-oxidation products that are soluble in the water spray droplets or film thereby creating an effluent water stream and an effluent gas stream*

The only reference to the use of water as disclosed by Masuda as relied upon by the Office may be found on page 419, paragraph (4). Masuda discloses “[t]he removal of the reaction products from the gas phase to avoid the reverse reaction. This can be...(d) the water film formed on the reactor wall to absorb the reaction products.” (Masuda: pg. 419, para. (4)). But, the disclosure of Masuda discloses the full oxidation, or burning, of gaseous pollutants, e.g. VOCs. (Masuda: Abstract). Because this is low temperature burning, one skilled in the art would not have looked to Masuda as the energy necessary, at room temperature, to convert water and CO₂ back into the reaction products would be significant, if not impractical.

Further, Masuda provides no empirical evidence or data showing the effect of water and provides no empirical evidence showing the ratio of water to gas, in combination with a plasma having certain electrical characteristics, necessary to prevent the reverse reaction and to remove the products of the reaction. Masuda fails to do so because the technical reason for Masuda disclosing the use of water cannot be backed up with data, as reverse reactions using low temperature burning require reaction energies in much for significant quantities than what Masuda is disclosing using.

In fact, Masuda at no time explicitly discloses that water has the effect that the Office is relying upon. In the preface to the paragraph disclosing the use of water, Masuda states, “[t]here are several aspects to be carefully considered in the application of PPCP....” That is all that Masuda discloses about the use of water. Masuda relies upon “water film formed on the reactor wall”, i.e. *one of the reaction products*, rather than providing a separate, meterable source of water. Thus, if there *can* be a reverse reaction at the temperatures and reaction disclosed by Masuda, there would be no water forming, as the water would be converting back to the reaction products. Thus, there would be no water to absorb any other reaction products.

The Office argues that “it appears that the water film formed on the reactor wall” can be formed by any method, such as the introduction of water. This does not comport with the language as used by Masuda. When Masuda discloses the introduction of material into the reaction, Masuda uses introduce, add, or additive or other similar terminology that specifically reflects the source. But, Masuda specifically uses the term “formed”, which would fit within technical aspect of Masuda, as the reaction of certain VOCs or other gases

may produce water as a reaction product. The Office's contention is expanding the disclosure of the reference beyond the explicit or implied teachings.

The Office further argues that even if no water film is formed, it would have been obvious to one skilled in the art to create the water film. As discussed above, one would have not looked to Masuda as the reaction of Masuda would obviate the necessity of a water stream. Further, Masuda explicitly discloses that the water used is to be a water film formed as a result of the reaction. Thus, even if one of ordinary skill in the art were to look to Masuda, it would not have been obvious to provide another water source, as Masuda explicitly discloses the source of the water is to be from the reaction, and thus, Masuda either teaches away from using water from another source or at least provides no suggestion or motivation to use another water source. Additionally, in a basic configuration as disclosed by Masuda, one of ordinary skill in the art would be reluctant to introduce a water stream, especially as a spray, into the plasma chamber with open high voltage electrodes.

Because Masuda is disclosing full oxidation rather than partial oxidation, provides a non-enabling disclosure for at least the purpose of obviousness, and, because the reaction is different than the recited reaction, would also necessarily fail to disclose the recitation of gas/water ratio.

One portion of the subject matter of the present invention goes to the heart of what the Office mischaracterizes Masuda to disclose. The inventors, after disclosing the use of a partial oxidation reaction using a plasma having certain electrical characteristics, thereafter had to determine, through significant theoretical modeling, testing and experimentation, a water to gas ratio that provides for the optimal removal of partially oxidized reaction products while negating or reducing the likelihood of the effects of having water in the presence of a high voltage electrode. The water spray, either in droplet or film, is provided at a ratio of *"about 0.2 to 2 milliliters/minute at one standard liter per minute of exhaust gas flow,"* as recited in claim 1.

Because of these significant technical differences and the technical incompleteness of Masuda, one of ordinary skill in the art would not have a reasonable expectation of success to rely upon Masuda to accomplish the recitations of claim 1. Thus, Masuda fails to disclose the recitations relied upon by the Office. Further, there is no teaching or suggestion to combine Schiffner or Makin, which are disclosing two different types of processes, with Masuda. For

at least these reasons, the combination of Masuda optionally in view of Makin or Schiffner fails to disclose all recitations of claim 1, and thus, fail to render claim 1 obvious.

Independent claim 1 – Sobacchi et al.

The Office further rejects claims 1-15 as allegedly being unpatentable over Sobacchi. The Office alleges that the third page of the reference, the first full paragraph, discloses the use of water as recited in claim 1. This is not the case. Sobacchi discloses, “A water flow rate equal to 0.25ml/min was provided and corona reactor temperature was kept equal to 220 degrees C for this series of tests.” There is no further disclosure of the water, its use, any flow ratios, etc. The reason for this is that the use of the water as disclosed by Sobacchi was to simulate the humidity of exhaust gases in pulp mills. Further, because it was injected into a reactor operating at 220 degrees C, all the water would have evaporated, and thus, no water film or droplets would be present in the reactor to absorb the partially reduced VOCs, as recited in claim 1. Thus, Sobacchi fails to disclose the recitations of claim 1, and thus fails to render claim 1 obvious.

The Applicants request reconsideration and withdrawal of the rejection to claim 1 under § 103.

Independent claims 6 and 10

For at least the reasons discussed above with regards to claim 1, claims 6 and 10 are also allowable. The Applicants request reconsideration and withdrawal of the rejections to claims 6 and 10 under § 103.

Dependent claims 2-5, 7-9 and 11-15

Because they are dependent upon an allowable base claim, it follows that claims 2-5, 7-9 and 11-15 are also allowable. The Applicants request reconsideration and withdrawal of the rejections to claims 2-5, 7-9 and 11-15 under § 103. Further, the Applicants respectfully request that the Office cite the portions of the reference(s) that allegedly disclose the recitations of the dependent claims. In the present Action, the Applicants are unable to properly form a response because the Office has not provided guidance as to what portions of the recited references allegedly disclose the recitations of the claims.

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PATENT

CONCLUSION

By the remarks and the amendments provided herein, the Applicant respectfully submits that the Office Action mailed June 24, 2009 has been traversed and that the application is in condition for allowance. If the Examiner has any concerns regarding the response provided herein, or wishes to discuss the response further, the Examiner is invited to contact the undersigned attorney.

The Commissioner is hereby authorized to charge any deficiency or credit any overpayment of the fees associated with this communication to Deposit Account No. 23-3050.

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